PATENT CLAIMS

1. A method for operating a partially closed, turbocharged gas turbine cycle, in which method fuel is burnt in a combustion chamber (6) when a gaseous, compressed working medium which contains combustion air is supplied, the working medium which contains the hot combustion gases is expanded in a turbine (2) of a gas turbine (1, 2, 3), performing work as it does so, heat is extracted from the expanded working medium in a downstream recuperator (5), the cooled working medium is then compressed in a compressor (1) of the gas turbine (1, 2, 3), and heat is fed to the compressed working medium in the recuperator (4) before it re-enters the combustion chamber (6), and in which method on the low-pressure side of the recuperator (5) some of the expanded working medium is removed at a removal location (9) which is at a suitable first temperature level and is expanded further in the turbine (14) of a first exhaust-gas turbocharger (ATL2), and air is sucked in and compressed by the compressor (13) of the first exhaust-gas turbocharger (ATL2), and the compressed air is fed to the working medium on the low-pressure side of the recuperator (5) at a feed location (10) which is at a suitable second temperature level, characterized in that a gas turbine (1, 2, 3) whose compressor (1) is designed as a radial compressor is used.

2. The method as claimed in claim 1, characterized in that the gas turbine (1, 2, 3) used is a second exhaust-gas turbocharger (ATL1).

3. The method as claimed in claim 1, characterized in that the gas turbine (1, 2, 3) used is a microturbine.

4. The method as claimed in one of claims 1 to 3, characterized in that the fraction of the working

medium which is removed at the removal location (9) is expanded in such a manner in the turbine (14) of the first exhaust-gas turbocharger (ATL2) that the power required to drive the compressor (13) of the first exhaust-gas turbocharger (ATL2) is produced.

5. The method as claimed in one of claims 1 to 4, characterized in that the quantity of air supplied to the working medium by the compressor (13) of the first exhaust-gas turbocharger (ATL2) at least covers the demand for combustion air in the combustion chamber (6).

6. The method as claimed in one of claims 1 to 5, characterized in that the second temperature level approximately corresponds to the compressor outlet temperature.

7. The method as claimed in one of claims 1 to 6, characterized in that heat is extracted from the working medium in a precooler (7) between the low-pressure-side exit from the recuperator (5) and the entry to the compressor (1) of the gas turbine (1, 2, 3).

8. The method as claimed in one of claims 1 to 7, characterized in that the rotational speed of the first exhaust-gas turbocharger (ATL2) is controlled by means of an auxiliary machine which is connected to the first exhaust-gas turbocharger (ATL2) and in particular takes the form of an electrical machine (15) connected to the grid system via converters, in order to set the level of turbo charging.

9. The method as claimed in one of claims 1 to 7, characterized in that the rotational speed of the first exhaust-gas turbocharger (ATL2) is controlled by an adjustable bypass (11) between the compressor (13) and

the turbine (14) of the first exhaust-gas turbocharger (ATL2) in order to set the level of turbocharging.

10. The method as claimed in claim 2, characterized in that the working medium which comes out of the compressor (1) of the gas turbine (1, 2, 3) is compressed further in the compressor of a third exhaust-gas turbocharger (ATL3) before it enters the recuperator (5), and in that the working medium which flows out of the combustion chamber (6) is initially expanded in the turbine (17) of the third exhaust-gas turbocharger (ATL3) before it enters the turbine (2) of the gas turbine (1, 2, 3).

11. The method as claimed in claim 10, characterized in that the working medium is cooled in an intercooler (12) before it enters the compressor (16) of the third exhaust-gas turbocharger (ATL3), and in that the exhaust gas from the turbine (17) of the third exhaust-gas turbocharger (ATL3) is reheated in a further combustion chamber (6').

12. A gas turbine system for carrying out the method as claimed in claim 1, comprising a gas turbine (1, 2, 3) having a compressor (1) and a turbine (2), which via a common shaft (3) drive a generator (4), and a combustion chamber (6), the exit of which is connected to the entry to the turbine (2) of the gas turbine (1, 2, 3), has a fuel feed (8) and receives combustion air from the exit of the compressor (1) of the gas turbine (1, 2, 3) via the high-pressure side of a recuperator (5), the exit of the turbine (2) and the entry to the compressor (1) of the gas turbine (1, 2, 3) being connected via the low-pressure side of the recuperator (5), and a first exhaust-gas turbocharger (ATL2) which sucks in air being connected to different locations (9, 10) of the low-pressure side of the recuperator (4) by means of the exit of its compressor (13) and the entry

to its turbine (14), characterized in that the compressor (1) of the gas turbine (1, 2, 3) is designed as a radial compressor.

13. The gas turbine system as claimed in claim 12, characterized in that the gas turbine (1, 2, 3) is designed as a second exhaust-gas turbocharger (ATL1).

14. The gas turbine system as claimed in claim 12, characterized in that the gas turbine (1, 2, 3) is designed as a microturbine.

15. The gas turbine system as claimed in one of claims 12 to 15 [sic], characterized in that a precooler (7), which can be used to discharge heating heat, is arranged between the entry to the compressor (1) of the gas turbine (1, 2, 3) and the low-pressure-side exit of the recuperator (5).

16. The gas turbine system as claimed in one of claims 12 to 16 [sic], characterized in that the first exhaust-gas turbocharger (ATL2) can be driven by an auxiliary machine, in particular in the form of an electrical machine (15) connected to the grid system via converters.

17. The gas turbine system as claimed in one of claims 12 to 16, characterized in that a bypass valve (11) is arranged between the exit from the compressor (13) and the entry to the turbine (14) of the first exhaust-gas turbocharger (ATL2).

18. The gas turbine system as claimed in one of claims 12 to 15, characterized in that a third exhaust-gas turbocharger (ATL3) is arranged between the gas turbine (1, 2, 3) and the high-pressure side of the recuperator (5), in such a manner that the compressor (16) of the third exhaust-gas turbocharger (ATL3) is arranged

between the exit from the compressor (1) of the gas turbine (1, 2, 3) and the high-pressure-side entry of the recuperator (4), and the turbine (17) of the third exhaust-gas turbocharger (ATL3) is arranged between the entry to the turbine (2) of the gas turbine (1, 2, 3) and the exit from the combustion chamber (6).

19. The gas turbine system as claimed in claim 18, characterized in that an intercooler (12) is arranged between the exit from the compressor (1) of the gas turbine (1, 2, 3) and the entry to the compressor (16) of the third exhaust-gas turbocharger (ATL3), and in that a further combustion chamber (6') is arranged between the turbine (17) of the third exhaust-gas turbocharger (ATL3) and the turbine (2) of the gas turbine (1, 2, 3).

20. The gas turbine system as claimed in one of claims 18 or 19, characterized in that the mass flow in the first exhaust-gas turbocharger (ATL2) is approximately a quarter of the mass flow in the second exhaust-gas turbocharger (ATL1), and in that the third exhaust-gas turbocharger (ATL3) is designed for approximately half the volumetric flow of the gas turbine (1, 2, 3).